*CLAIMS*

WHAT IS CLAIMED IS:

1. A radio communication apparatus comprising:

a channel quality monitoring section for monitoring channel quality of each of arriving waves that arrive at a plurality of array antennas;

a computing section for calculating a set of weights for elements of each of the plurality of array antennas, the set of weights being such values as to allow each of the array antennas to function as an adaptive beam forming array antenna;

a weight setting section for selecting a particular set of weights from the calculated sets of weights, and for applying the particular set of weights in common to the plurality of array antennas, the particular set of weights being to be applied to an array antenna that has received an arriving wave with maximum channel quality as monitored by the channel quality monitoring section; and

a combining section for combining arriving waves received with the plurality of array antennas to which the particular set of weights are applied.

2. A radio communication apparatus comprising:

a channel quality monitoring section for monitoring channel quality of each of arriving waves that arrive at a plurality of array antennas;

a computing section for calculating a set of weights for elements of each of the plurality of array antennas, the set of weights being such values as to allow each of the array antennas to function as an adaptive null-forming array antenna;

a weight setting section for selecting a particular set of weights from the calculated sets of weights, and for applying the particular set of weights in common to the plurality of array antennas, the particular set of weights being to be applied to an array antenna that has received an arriving wave with maximum channel quality as monitored by the channel quality

monitoring section; and

a combining section for combining arriving waves received with the plurality of array antennas to which the particular set of weights are applied.

3. A radio communication apparatus comprising:

a channel quality monitoring section for monitoring channel quality of each of arriving waves that arrive at a plurality of array antennas;

a computing section for calculating arrival angles of a desired wave and of a disturbing wave as the arriving waves for each of the plurality of array antennas;

a weight setting section for selecting arrival angles of a desired wave and of a disturbing wave from the calculated arrival angles, and for applying a particular set of weights in common to the plurality of array antennas, the desired wave and disturbing wave being arrival waves with good channel quality as monitored by the channel quality monitoring section, the particular set of weights being such values as to allow each of the plurality of array antennas to have a main lobe in a direction of the arrival angle of the desired wave, and a null point in a direction of the arrival angle of the disturbing wave; and

a combining section for combining arriving waves received with the plurality of array antennas to which the particular set of weights are applied.

4. A radio communication apparatus comprising:

a channel quality monitoring section for monitoring channel quality of each of arriving waves that arrive at a plurality of array antennas;

a computing section for calculating, for each of the plurality of array antennas, arrival angles of a desired wave and of a disturbing wave as the arriving waves and a set of weights, the set of weights being such values as to allow each of the array antennas to function as an adaptive null-forming array antenna;

a weight setting section for selecting, from the calculated arrival angles, arrival

angles of a desired wave and of a disturbing wave as arrival waves with good channel quality as monitored by the channel quality monitoring section, for correcting one of the calculated sets of weights to such values as to allow an array antenna to have a main lobe in a direction of the arrival angle of the desired wave, and a null point in a direction of the arrival angle of the disturbing wave, and for applying the corrected set of weights in common to the plurality of array antennas, the array antenna having received an arriving wave with maximum channel quality as monitored by the channel quality monitoring section; and

a combining section for combining arriving waves received with the plurality of array antennas to which the corrected set of weights are applied.

5. The radio communication apparatus according to claim 3, wherein:

each of the plurality of array antennas is composed of elements; and

the elements of each of the array antennas are arranged on a same virtual line or plane parallel to each position of the plurality of array antennas.

6. The radio communication apparatus according to claim 4, wherein:

each of the plurality of array antennas is composed of elements; and

the elements of each of the array antennas are arranged on a same virtual line or plane parallel to each position of the plurality of array antennas.

7. The radio communication apparatus according to claim 1, further comprising

feeding section(s) provided on feed line(s) of all or part of the plurality of array antennas, for employing a set of weights for transmitting a transmission wave via the feed line(s), the set of weights being obtained by correcting the particular set of weights in accordance with frequency differences between the transmission wave and the arriving waves.

8. The radio communication apparatus according to claim 2, further comprising

feeding section(s) provided on feed line(s) of all or part of the plurality of array antennas, for employing a set of weights for transmitting a transmission wave via the feed

line(s), the set of weights being obtained by correcting the particular set of weights in accordance with frequency differences between the transmission wave and the arriving waves.

9. The radio communication apparatus according to claim 3, further comprising

feeding section(s) provided on feed line(s) of all or part of the plurality of array antennas, for employing a set of weights for transmitting a transmission wave via the feed line(s), the set of weights being obtained by correcting the particular set of weights in accordance with frequency differences between the transmission wave and the arriving waves.

10. The radio communication apparatus according to claim 4, further comprising

feeding section(s) provided on feed line(s) of all or part of the plurality of array antennas, for employing a set of weights for transmitting a transmission wave via the feed line(s), the set of weights being obtained by correcting the particular set of weights in accordance with frequency differences between the transmission wave and the arriving waves.

11. The radio communication apparatus according to claim 1, further comprising

feeding section(s) for applying the particular set of weights to feeding line(s) of transmission array antenna(s) which is/are used for transmission of a transmission wave having a different frequency from frequencies of the arriving waves, wherein

all or part of the plurality of array antennas is/are paired with the transmission array antenna(s).

12. The radio communication apparatus according to claim 2, further comprising

feeding section(s) for applying the particular set of weights to feeding line(s) of transmission array antenna(s) which is/are used for transmission of a transmission wave having a different frequency from frequencies of the arriving waves, wherein

all or part of the plurality of array antennas is/are paired with the transmission array antenna(s).

13. The radio communication apparatus according to claim 3, further comprising

feeding section(s) for applying the particular set of weights to feeding line(s) of transmission array antenna(s) which is/are used for transmission of a transmission wave having a different frequency from frequencies of the arriving waves, wherein

all or part of the plurality of array antennas is/are paired with the transmission array antenna(s).

14. The radio communication apparatus according to claim 4, further comprising

feeding section(s) for applying the particular set of weights to feeding line(s) of transmission array antenna(s) which is/are used for transmission of a transmission wave having a different frequency from frequencies of the arriving waves, wherein

all or part of the plurality of array antennas is/are paired with the transmission array antenna(s).

15. A radio communication apparatus comprising:

a channel quality monitoring section for monitoring channel quality of each of arriving waves that arrive at a plurality of aerial beam forming antennas;

a computing section for calculating a set of reactances for elements of each of the plurality of aerial beam forming antennas, the set of reactances being loaded on each of the elements of the aerial beam forming antennas;

a reactance setting section for selecting a particular set of reactances from the calculated sets of reactances, and for applying the particular set of reactances in common to the plurality of aerial beam forming antennas, the particular set of reactances being loaded on an aerial beam forming antenna having received an arriving wave with maximum channel quality as monitored by the channel quality monitoring section; and

a combining section for combining arriving waves received with the plurality of aerial beam forming antennas on which the particular set of reactances are loaded.

16. A radio communication apparatus comprising:

a channel quality monitoring section for monitoring channel quality of each of arriving waves that arrive at a plurality of aerial beam forming antennas;

a computing section for calculating a set of reactances for elements of each of the plurality of aerial beam forming antennas, the set of reactances being loaded on each element of the aerial beam forming antennas and being such values as to allow each of the aerial beam forming antennas to function as an adaptive null-forming array antenna;

a reactance setting section for selecting a particular set of reactances from the calculated sets of reactances, and for applying the particular set of reactances in common to the plurality of aerial beam forming antennas, the particular set of reactances being loaded on an aerial beam forming antenna having received an arriving wave with maximum channel quality as monitored by the channel quality monitoring section; and

a combining section for combining arriving waves received with the plurality of aerial beam forming antennas on which the particular set of reactances are loaded.

17. A radio communication apparatus comprising:

a channel quality monitoring section for monitoring channel quality of each of arriving waves that arrive at a plurality of aerial beam forming antennas;

a computing section for calculating arrival angles of a desired wave and of a disturbing wave as the arriving waves for each of the plurality of aerial beam forming antennas;

a reactance setting section for selecting arrival angles of a desired wave and of a disturbing wave from the calculated arrival angles, and for applying a particular set of reactances in common to the plurality of aerial beam forming antennas, the desired wave and disturbing wave being arriving waves with good channel quality as monitored by the channel quality monitoring section, the particular set of reactances being such values as to allow each of the plurality of aerial beam forming antennas to have a main lobe in a direction of the

arrival angle of the desired wave, and a null point in a direction of the arrival angle of the disturbing wave; and

a combining section for combining arriving waves received with the plurality of aerial beam forming antennas on which the particular set of reactances are loaded.

18. A radio communication apparatus comprising:

a channel quality monitoring section for monitoring channel quality of each of arriving waves that arrive at a plurality of aerial beam forming antennas;

a computing section for calculating, for each of the plurality of aerial beam forming antennas, arrival angles of a desired wave and of a disturbing wave and a set of reactances, the set of reactances being such values as to allow each of the aerial beam forming antennas to function as an adaptive null-forming array antenna;

a reactance setting section for selecting arrival angles of a desired wave and of a disturbing wave from the calculated arrival angles, and for correcting one of the calculated sets of reactances to such values as to allow an aerial beam forming antenna to have a main lobe in a direction of the arrival angle of the desired wave, and a null point in a direction of the arrival angle of the disturbing wave, and for applying the corrected set of reactances in common to the plurality of aerial beam forming antennas, the desired wave and disturbing waves being arriving waves with good channel quality as monitored by the channel quality monitoring section, the aerial beam forming antenna having received an arriving wave with maximum channel quality as monitored by the channel quality monitoring section; and

a combining section for combining arriving waves received with the plurality of aerial beam forming antennas on which the corrected set of reactances are loaded.

19. The radio communication apparatus according to claim 17, wherein:

each of the plurality of aerial beam forming antennas is composed of elements; and

the elements of each of the aerial beam forming antennas are arranged on a same

virtual line or plane parallel to each position of the plurality of the aerial beam forming antennas.

20. The radio communication apparatus according to claim 18, wherein:

each of the plurality of aerial beam forming antennas is composed of elements; and

the elements of each of the aerial beam forming antennas are arranged on a same virtual line or plane parallel to each position of the plurality of the aerial beam forming antennas.

21. The radio communication apparatus according to claim 15, further comprising

feeding section(s) provided on feed line(s) of all or part of the plurality of aerial beam forming antennas, for employing a set of reactances for transmitting a transmission wave via the feed line(s), the set of reactances being obtained by correcting the particular set of reactances in accordance with frequency differences between the transmission wave and the arriving waves.

22. The radio communication apparatus according to claim 16, further comprising

feeding section(s) provided on feed line(s) of all or part of the plurality of aerial beam forming antennas, for employing a set of reactances for transmitting a transmission wave via the feed line(s), the set of reactances being obtained by correcting the particular set of reactances in accordance with frequency differences between the transmission wave and the arriving waves.

23. The radio communication apparatus according to claim 17, further comprising

feeding section(s) provided on feed line(s) of all or part of the plurality of aerial beam forming antennas, for employing a set of reactances for transmitting a transmission wave via the feed line(s), the set of reactances being obtained by correcting the particular set of reactances in accordance with frequency differences between the transmission wave and the arriving waves.

24. The radio communication apparatus according to claim 18, further comprising

feeding section(s) provided on feed line(s) of all or part of the plurality of aerial beam forming antennas, for employing a set of reactances for transmitting a transmission wave via the feed line(s), the set of reactances being obtained by correcting the particular set of reactances in accordance with frequency differences between the transmission wave and the arriving waves.

25. The radio communication apparatus according to claim 15, further comprising

feeding section(s) for applying the particular set of reactances to feeding line(s) of transmission aerial beam forming antenna(s) which is/are used for transmission of a transmission wave having a different frequency from frequencies of the arriving waves, wherein

all or part of the plurality of aerial beam forming antennas is/are paired with the transmission aerial beam forming antenna(s).

26. The radio communication apparatus according to claim 16, further comprising

feeding section(s) for applying the particular set of reactances to feeding line(s) of transmission aerial beam forming antenna(s) which is/are used for transmission of a transmission wave having a different frequency from frequencies of the arriving waves, wherein

all or part of the plurality of aerial beam forming antennas is/are paired with the transmission aerial beam forming antenna(s).

27. The radio communication apparatus according to claim 17, further comprising

feeding section(s) for applying the particular set of reactances to feeding line(s) of transmission aerial beam forming antenna(s) which is/are used for transmission of a transmission wave having a different frequency from frequencies of the arriving waves, wherein

all or part of the plurality of aerial beam forming antennas is/are paired with the transmission aerial beam forming antenna(s).

28. The radio communication apparatus according to claim 18, further comprising

feeding section(s) for applying the particular set of reactances to feeding line(s) of transmission aerial beam forming antenna(s) which is/are used for transmission of a transmission wave having a different frequency from frequencies of the arriving waves, wherein

all or part of the plurality of aerial beam forming antennas is/are paired with the transmission aerial beam forming antenna(s).

29. A radio communication apparatus comprising:

a channel quality monitoring section for monitoring channel quality of each of arriving waves that arrive at a plurality of adaptive beam forming array antennas;

a weight setting section for selecting a particular set of weights from sets of weights which are to be loaded on the plurality of adaptive beam forming array antennas, and for applying the particular set of weights as corrected values in common to the plurality of adaptive beam forming array antennas, the particular set of weights being to be applied to an adaptive beam forming array antenna that has received an arriving wave with maximum channel quality as monitored by the channel quality monitoring section; and

a combining section for combining arriving waves received with the plurality of adaptive beam forming array antennas.

30. A radio communication apparatus comprising:

a channel quality monitoring section for monitoring channel quality of each of arriving waves that arrive at a plurality of adaptive null-forming array antennas;

a weight setting section for selecting a particular set of weights from sets of weights which are to be loaded on the plurality of adaptive null-forming array antennas, and for

applying the particular set of weights as corrected values in common to the plurality of adaptive null-forming array antennas, the particular set of weights being to be applied to an adaptive null-forming array antenna that has received an arriving wave with maximum channel quality as monitored by the channel quality monitoring section; and

a combining section for combining arriving waves received with the plurality of adaptive null-forming array antennas.

31. A radio communication apparatus comprising:

a channel quality monitoring section for monitoring channel quality of each of arriving waves that arrive at a plurality of adaptive null-forming array antennas;

a computing section for calculating arrival angles of a desired wave and of a disturbing wave as the arriving waves for each of the plurality of adaptive null-forming array antennas;

a weight setting section for selecting arrival angles of a desired wave and of a disturbing wave from the calculated arrival angles, and for applying a particular set of weights as corrected values in common to the plurality of adaptive null-forming array antennas, the desired wave and disturbing wave being arrival waves with good channel quality as monitored by the channel quality monitoring section, the particular set of weights being such values as to allow each of the plurality of adaptive null-forming array antennas to have a main lobe in a direction of the arrival angle of the desired wave, and a null point in a direction of the arrival angle of the disturbing wave; and

a combining section for combining arriving waves received with the plurality of adaptive null-forming array antennas.

32. A radio communication apparatus comprising:

a channel quality monitoring section for monitoring channel quality of each of arriving waves that arrive at a plurality of adaptive null-forming array antennas;

a computing section for calculating arrival angles of a desired wave and of a disturbing wave as the arriving waves for each of the plurality of adaptive null-forming array antennas;

a weight setting section for selecting, from the calculated arrival angles, arrival angles of a desired wave and of a disturbing wave as arrival waves with good channel quality as monitored by the channel quality monitoring section, for correcting a set of weights to be applied to an adaptive null-forming antenna to such values as to allow the adaptive null-forming array antenna to have a main lobe in a direction of the arrival angle of the desired wave, and a null point in a direction of the arrival angle of the disturbing wave, and for applying the corrected set of weights in common to the plurality of adaptive null-forming array antennas, the adaptive null-forming array antenna having received an arriving wave with maximum channel quality as monitored by the channel quality monitoring section; and

a combining section for combining arriving waves received with the plurality of adaptive null-forming array antennas.

33. The radio communication apparatus according to claim 31, wherein:

each of the plurality of adaptive null-forming array antennas is composed of elements; and

the elements of each of the adaptive null-forming array antennas are arranged on a same virtual line or plane parallel to each position of the plurality of adaptive null-forming antennas.

34. The radio communication apparatus according to claim 32, wherein:

each of the plurality of adaptive null-forming array antennas is composed of elements; and

the elements of each of the adaptive null-forming array antennas are arranged on a same virtual line or plane parallel to each position of the plurality of adaptive null-forming

antennas.

35. The radio communication apparatus according to claim 29, further comprising feeding section(s) provided on feed line(s) of all or part of the plurality of adaptive beam forming array antennas, for employing a set of weights for transmitting a transmission wave via the feed line(s), the set of weights being obtained by correcting the particular set of weights in accordance with frequency differences between the transmission wave and the arriving waves.

36. The radio communication apparatus according to claim 30, further comprising feeding section(s) provided on feed line(s) of all or part of the plurality of adaptive null-forming array antennas, for employing a set of weights for transmitting a transmission wave via the feed line(s), the set of weights being obtained by correcting the particular set of weights in accordance with frequency differences between the transmission wave and the arriving waves.

37. The radio communication apparatus according to claim 31, further comprising feeding section(s) provided on feed line(s) of all or part of the plurality of adaptive null-forming array antennas, for employing a set of weights for transmitting a transmission wave via the feed line(s), the set of weights being obtained by correcting the particular set of weights in accordance with frequency differences between the transmission wave and the arriving waves.

38. The radio communication apparatus according to claim 32, further comprising feeding section(s) provided on feed line(s) of all or part of the plurality of adaptive null-forming array antennas, for employing a set of weights for transmitting a transmission wave via the feed line(s), the set of weights being obtained by correcting the particular set of weights in accordance with frequency differences between the transmission wave and the arriving waves.

39. The radio communication apparatus according to claim 29, further comprising

feeding section(s) for applying the particular set of weights to feeding line(s) of transmission array antenna(s) which is/are used for transmission of a transmission wave having a different frequency from frequencies of the arriving waves, wherein

all or part of the plurality of adaptive null-forming array antennas is/are paired with the transmission array antenna(s).

40. The radio communication apparatus according to claim 30, further comprising

feeding section(s) for applying the particular set of weights to feeding line(s) of transmission array antenna(s) which is/are used for transmission of a transmission wave having a different frequency from frequencies of the arriving waves, wherein

all or part of the plurality of adaptive null-forming array antennas is/are paired with the transmission array antenna(s).

41. The radio communication apparatus according to claim 31, further comprising

feeding section(s) for applying the particular set of weights to feeding line(s) of transmission array antenna(s) which is/are used for transmission of a transmission wave having a different frequency from frequencies of the arriving waves, wherein

all or part of the plurality of adaptive null-forming array antennas is/are paired with the transmission array antenna(s).

42. The radio communication apparatus according to claim 32, further comprising

feeding section(s) for applying the particular set of weights to feeding line(s) of transmission array antenna(s) which is/are used for transmission of a transmission wave having a different frequency from frequencies of the arriving waves, wherein

all or part of the plurality of adaptive null-forming array antennas is/are paired with the transmission array antenna(s).